(e) Attach the sample extension to the exhaust outlet.

(f) Turn on instruments and allow them to warm up as necessary.

(g) Begin sampling. You do not need to begin recording the data at this point.

(h) Begin operating the vehicle or equipment in a normal manner.

NOTE: We may require you to operate the vehicle or equipment in a specific manner.

(i) Begin recording engine speed, engine torque (or surrogate), intake air flow, emissions data (THC, NO_X, CO, air/fuel ratio), and time. This time marks the beginning of the sampling period.

(j) Continue recording data and operating the vehicle or equipment in a normal manner until the end of the sampling period. The length of the sampling period is based on good engineering practice, the precision requirements of § 1065.910, and applicable limits in the standard-setting part.

(k) You may measure background concentrations and correct measured emission values accordingly. However, if any background corrections are equivalent to 5 percent or more of the maximum emissions allowed by the applicable standard, the test shall be voided and repeated in an environment with lower background concentrations.

§ 1065.925 Calculations.

(a) [Reserved]

(b) Convert emission analyzer data to instantaneous concentrations in ppm (ppmC for the FID).

(c) Calculate instantaneous exhaust volumetric flow rates in standard m^3/hr (volume and density values used in these calculations are corrected to standard conditions of 20 °C and 101.3 kPa.). Calculate exhaust volumetric flow rate from the following equation:

Exhaust volumetric flow rate = (intake air mass flow rate)(1+mass fuel/air ratio)/(density of exhaust)

(1) If you do not know the instantaneous density of the exhaust, use the minimum density of the exhaust that occurs over the course of the test, corrected to standard conditions.

(2) For gasoline-fueled engines designed to be operated at stoichiometric fuel/air ratios, you may assume that the density of the exhaust is 1202 g/m^3 at standard conditions of 20 °C and 101.3 kPa.

(3) For LPG-fueled engines designed to be operated at stoichiometric fuel/air ratios, you may assume that the density of the exhaust is 1175 g/m^3 at standard conditions of 20 °C and 101.3 kPa.

(4) For CNG-fueled engines designed to be operated at stoichiometric fuel/air ratios, you may assume that the density of the exhaust is 1149 g/m^3 at standard conditions of 20 °C and 101.3 kPa.

(d) Calculate instantaneous emission rates (g/hr) using the following general equation:

Emission rate = (exhaust volumetric flow rate)(ppm)(density factor)/10^6

Where:

Density factors are 576.8 g/m^3 for THC, 1913 g/m^3 for NO_X, 1164 g/m^3 for CO.

(e) Integrate instantaneous emission rates for the entire specified sample period.

(f) Determine instantaneous brake torque and speed.

(g) Calculate instantaneous brake power.

(h) Integrate instantaneous brake power for the entire specified sample period.

(i) Divide the integrated emission rates by the integrated brake power. These are your final brake-specific emission rates.

§ 1065.930 Specifications for mass air flow sensors.

(a) Measure the intake air flow using the engine's mass air flow sensor. If the engine is not equipped with a mass air flow sensor, you need to install one.

(b) The sensor design must have an accuracy and precision of ±5 percent under steady-state laboratory conditions.

(c) The sensor must reach at least 90 percent of its final response within 0.3 seconds after any step change to the flow rate greater than or equal 80 percent of full scale.

(d) Calibrate the sensor according to good engineering practice. Verify for each engine before testing that the sensor accurately reads the idle intake air flow rate based on measured manifold